Claims

1. A peptide c h a r a c t e r i s e d in that it

a) is at least 8 amino acids long and is a fragment of a mutant βAPP and/or Ubi-B protein arising from a frameshift mutation associated with Alzheimer's disease and/or Down syndrome;

and

b) consists of at least one amino acid of the mutant part of the mutant βAPP and/or Ubi-B protein;

and

c) comprises 0-10 amino acids corresponding to the carboxyl terminus of the normal part of the protein sequence preceding the amino terminus of the mutant sequence and may further extend to the carboxyl terminus of the mutant part of the protein as determined by a new stop codon generated by the relevant frameshift mutation;

and

d) induces, either in its full length or after processing by antigen presenting cells, T cell responses.

2. A peptide according to claim 1 characterised in that it contain 8-25 amino acids.

3. A peptide according to claim 1 characterised in that it contain 9-20 amino acids.

4. A peptide according to claim 1 characterised in that it contain 9-16 amino acids.

5. A peptide according to claim 1 characterised in that it contain 8-12 amino acids.

6. A peptide according to claim 1 characterised in that it contain 20-25 amino acids.

7. A peptide according to claim 1 characterised in that it contains 9 amino acids.

8. A peptide according to claim 1 characterised in that it contains 12 amino acids.

9. A peptide according to claim 1 characterised in that it contains 13 amino acids.

10. A peptide according to claim 1 characterised in that it is selected from a group of peptides having the following sequence identity numbers:
seq id no. 1 - seq id no. 10 or a fragment of any of these.

11. A pharmaceutical composition comprising a peptide according to any of the above claims and a pharmaceutically acceptable carrier or diluent.

12. A vaccine for Alzheimer's disease comprising a peptide according to any of the claims 1-10 and a pharmaceutically acceptable carrier or diluent.

13. Use of a peptide according to any of the claims 1-10 for the preparation of a pharmaceutical composition for treatment or prophylaxis of Alzheimer's disease or treatment of Down syndrome.

14. Method for vaccination of a person disposed for or afflicted with Alzheimer's disease, consisting of administering at least one peptide according to the claims 1-10, one or more times, in an amount sufficient for induction of specific T-cell immunity to mutant βAPP and/or mutant Ubi-B peptides associated with Alzheimer's disease and/or Down syndrome.

15. Method according to claim 14 wherein the amount of the peptides is in the range of 1 microgram (1 µg) to 1 gram (1g) and preferentially in the rage of 1 microgram (1 µg) to 1 milligram (1 mg) for each administration.

16. Method for treatment of a patient afflicted with Alzheimer's disease or Down syndrome, by stimulating *in vivo* or *ex vivo* with peptides according to the claims 1-10.

17. Method according to claim 16 wherein the amount of the peptides used is in the range of 1 microgram (1 µg) to 1 gram (1g) and preferentially in the rage of 1 microgram (1 µg) to 1 milligram (1 mg) for each administration.

18. An isolated DNA sequence comprising a DNA sequence or variants thereof encoding a frameshift mutant peptide according to claim 1.

19. An isolated DNA sequence according to claim 18 encoding peptides comprising seq. id. no: 1-10 or variants thereof.

20. Use of a DNA sequence according to any of the claims 18-19 for the preparation of a pharmaceutical composition for treatment or prophylaxis of Alzheimer's disease or treatment of Down syndrome.

21. Method for treatment of a person disposed for or afflicted with Alzheimer's disease or afflicted with Down syndrome, by stimulating *in vivo* or *ex vivo* with DNA sequences according to the claims 18-19.

22. A plasmid or virus vector comprising DNA sequences of claim 18 encoding a frameshift mutant βAPP peptide and/or Ubi-B peptide associated with Alzheimer's disease or Down syndrome.

23. A vector according to claim 22 wherein the vector is *E.Coli* plasmid, a Listeria vector and recombinant viral vectors. Recombinant viral vectors include, but are not limited to orthopox virus, canary virus, capripox virus, suipox virus, vaccinia, baculovirus, human adenovirus, SV40 or bovine papilloma virus.

24. Use of a plasmid or virus vector according to claim 22 for the preparation of a pharmaceutical composition for treatment or prophylaxis of Alzheimer's disease or treatment of Down syndrome.

25. Method for treatment of a person disposed for or afflicted with Alzheimer's disease or afflicted with Down syndrome, by stimulating *in vivo* or *ex vivo* with plasmids or virus vectors according to claim 22.